BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In The Matter Of PUBLIC UTILITIES COMMISSION Instituting a Proceeding to Investigate Distributed Generation in Hawaii.	DOCKET NO. 03-0371

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2004 MAY -7 P 4:08

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PRELIMINARY STATEMENT OF POSITION

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AND

CERTIFICATE OF SERVICE

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PRELIMINARY STATEMENT OF POSITION

HAWAIIAN ELECTRIC COMPANY, INC. ("HECO"), HAWAII ELECTRIC LIGHT COMPANY, INC. ("HELCO"), and MAUI ELECTRIC COMPANY, LIMITED ("MECO") (HECO, HELCO, and MECO are collectively referred to as the "Companies") respectfully submit their Preliminary Statement of Position, attached as Exhibit A, pursuant to Prehearing Order No. 20922 issued April 23, 2004 in Docket No.03-0371.

DATED: Honolulu, Hawaii, May 7, 2004.

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HAWAIIAN ELECTRIC COMPANY, INC.
HAWAII ELECTRIC LIGHT COMPANY, INC.
MAUI ELECTRIC COMPANY, LIMITED

EXHIBIT A

Planning Issues

Issue 1. What forms of distributed generation (e.g. renewable energy facilities, hybrid renewable energy systems, generation, cogeneration) are feasible and viable for Hawaii?

HECO/HELCO/MECO Preliminary Position:

As defined by the Commission in this Docket, distributed generation involves the use of small scale electric generating technologies installed at, or in close proximity to, the end-user's location. The Companies have not attempted to define "small" for purposes of this proceeding, but note that "small" should be construed relative to the utility's system loads, and to the loads of large customers. Cogeneration facilities at or near a steam host's site that are installed primarily for the purpose of supplying electricity to the utility, that use the utility's transmission system to transmit electricity to the grid for sale by the utility, or that otherwise act like central station generation, should not be considered distributed generation for purposes of this proceeding.

In order for a form of DG to be "feasible and viable for Hawaii", it must be (1) technically feasible, (2) commercially available, (3) economically viable (i.e., cost-effective versus other options), (4) price competitive in the short-term, (5) sustainable in the long-term (i.e., backed up by adequate infrastructure support with respect to O&M and fuel), (6) able to address site-specific constraints (e.g., with respect to permitting) and (7) able to meet the perceived needs of customers.

The forms of DG that are "feasible and viable" may differ depending on the intended applications of the DG. As indicated by current utility and customer applications, DG uses in Hawaii have included (1) customer-sited emergency generation,

(2) (on one island) substation-sited peaking generation (i.e., HELCO's four dispersed 1 MW generators), (3) (in one instance) substation-sited generation to address a case-specific transmission problem (MECO's Hana generators), (4) commercial customer-sited generation for combined heat and power ("CHP") systems, (5) industrial customer-sited cogeneration, (6) off-grid, customer-sited generation for electricity power purposes, and (7) (to a limited extent) customer-sited generation, operated in parallel with the utility grid, for electricity power purposes only.

DG Technologies

DG technologies include conventional internal combustion engines ("ICE's") and combustion turbines, renewable technologies such as wind and photovoltaic ("PV") systems, and developing technologies such as fuel cells and microturbines.

CHP systems are a form of DG that utilize waste heat from the power generation process as energy (heat or steam) for heating or cooling purposes. The advantage of a CHP system over conventional electric generating units is the increased efficiency obtained when the captured waste heat is put to useful purposes. The thermal efficiency of fuel usage typically ranges from 85 to 90% for a CHP system compared to 35 to 40% for conventional central station generating units.

ICEs are the most mature and proven DG technology and have been used for decades for emergency power, standby power, peaking, cycling, baseload, and cogeneration applications. ICEs are suited for DG applications because of their small capacities, low capital cost, high efficiency, quick startup, high reliability, fuel flexibility, and cycling capability. However, some disadvantages associated with ICEs are air emissions, noise, and maintenance. ICEs are operated with fuel oils or natural gas. In

Hawaii, diesel fuel, propane or liquefied petroleum gas ("LPG"), and synthetic natural gas (in areas served by the gas utility distribution pipeline system) can be used for ICEs in DG applications. The choice of fuel is driven by economic and permitting conditions.

Microturbines are developing DG technology that is just beginning to be commercially available. Microturbines are generally less than 100kW in size and are targeted for emergency power, standby power, peaking, cycling, baseload, and cogeneration applications. Microturbines are suited for DG applications because of their compact size, low emissions, and cycling capability. However, some major disadvantages associated with microturbines are the low efficiency, unproven reliability, noise and high costs. Microturbines are being developed to use a variety of fuels, primarily natural gas, propane, diesel, methanol, bio-gasses, and gasoline. In Hawaii, diesel, propane, and synthetic natural gas would be the most logical fuel choices because of their availability and relative cost.

Fuel cells are devices that electrochemically convert energy from fuel gases such as hydrogen, natural gas, or vaporized special-duty propane directly into electricity. When fuels other than pure hydrogen are used, a fuel processing system, called a reformer, is required to convert fossil fuels such as natural gas, propane, light distillates, methanol, or biogas into hydrogen-rich gas. In Hawaii, synthetic natural gas or HD-5 grade propane would need to be used.

In general, fuel cell power plants are characterized by high efficiency, minimal emissions, little noise, and small land requirements. Fuel cells, however, are still in the development and testing phase, and the cost of using existing technologies would be high, assuming that the fuel cells were available in sufficient quantities and the fuel infrastructure requirements could be met.

Fuel cell technologies are under various stages of development. (Commercial production of phosphoric acid fuel cells has now been discontinued.) There remain a number of key issues that need to be overcome before commercialization of the various fuel cell technologies can occur, including successful scale-up, manufacturing costs, durability, and reliability. Until the commercial products are released and significant field experience is obtained, the cost and performance values could change.

With respect to renewable energy, PV systems (often combined with battery energy storage) are a proven, commercially available technology. However, there are few installations without government, foundation or utility support. Larger installations in Hawaii generally have been supported by grants or the utilities (e.g., the Companies' Sunpower for Schools Program). There are few installations on grid-connected homes despite the support through State tax credits and the utility net energy metering tariffs.

Wind generation using wind turbine generators ("WTG's") is another proven, commercially available technology. Wind farms that supply electricity to the utility grid appear to be economically feasible, with the availability of State tax credits (and, perhaps, federal production tax credits). There have been customer-sited installations (e.g., Lalamilo was sited at a BWS well site on the Big Island), but these installations may also be driven by the ability to sell "excess" electricity to the electric grid. It remains to be seen whether small, customer-sited WTG installations are economically feasible, taking into consideration costs and siting constraints.

Other Practical Issues

There are additional practical issues associated with the implementation of DG, including:

- Fuel Supply – Most of the DG technologies discussed utilize natural gas as fuel, which is not available in Hawaii. Synthetic natural gas ("SNG"), a petroleum product, is only available in certain areas. DG technologies that utilize propane or diesel will require the installation of new fuel storage tanks, to the extent that existing fuel tanks are unavailable.
- Siting – Much of Honolulu, for example, is highly urbanized and developed. Therefore, finding adequate space for the DG installations and associated fuel infrastructure, on or near the customer's site, can be difficult given Hawaii's high land costs and competing land uses.
- Permitting – The installation of DG involves various permits and approvals, depending on the locations and size of the installations. These approvals will require that noise, visual, water discharge, hazardous waste, and emissions impacts are fully addressed.

One of the key limiting factors for many distributed generation technologies in Hawaii is the lack of natural or synthetic gas at a price that permits the DG to compete with central station economics. Modifications required to burn liquid fuel or propane in micro-turbines or fuel cells generally increase initial and/or operating costs to the point that some technologies are no longer economical. Basic economics is the single major impediment to the wide-spread deployment of DG in Hawaii. When compared to many mainland locales, Hawaii is handicapped by high local construction labor costs and the added shipping costs for equipment. In order for DG to be accepted in Hawaii, it must be highly efficient (such as CHP systems) and the application must be large enough for a reasonable economy of scale.

<u>Issue 2.</u> Who should own and operate distributed generation projects?

<u>HECO/HELCO/MECO Preliminary Position</u>:

In responding to Issue No. 1, the Companies identified seven categories of DG applications. The ownership/operation and maintenance (O&M) options for each DG application are as follows:

(1) Customer-sited emergency generation: Generally owned by customers, although utilities offer a utility-ownership option in a few jurisdictions;

(2) Substation-sited peaking generation: Owned by utilities;

(3) Substation-sited generation to address case-specific transmission and/or distribution ("T&D") problems: Owned by utilities;

(4) Customer-sited CHP: May be owned by customers, third-party vendors/equipment lessors, or utilities;

(5) Customer-sited cogeneration: Generally owned by customers or independent power producers, although utilities may consider owning certain facilities or having a partial or indirect ownership interest in such cogeneration;

(6) Off-grid, customer-sited generation: Generally owned by customers; and

(7) Customer-sited generation operated in parallel with the utility grid: May be owned by customers or third-party vendors/equipment lessors or by utilities (if such ownership is a cost-effective utility option).

Where the customer owns the DG, or acquires the DG through an equipment lease, the customer generally is responsible for O&M, or can contract O&M to a third-party vendor. Where a third-party vendor owns the DG, the third-party vendor generally would be responsible for O&M, unless the vendor subcontracts that responsibility to a third-party service provider, or the vendor's contract with the customer allocate some or all of that responsibility to the customer.

In the case of the Companies, they do not currently intend to be involved in owning customer-sited emergency generation. However, a few utilities have offered to provide emergency generators under a tariff program, with or without reserving the right to operate the "emergency" generator for peaking purposes when the utility is short of capacity.

The Companies intend to offer CHP systems to customers in circumstances where utility-ownership of such system is cost-effective and does not burden non-participating customers.

The Companies would consider owing and operating an industrial customer-sited cogeneration facility that sells electricity and process steam to the industrial host, and that delivers electricity in excess of the host's requirements to the utility. Generally, however, such a project should be considered outside the scope of this proceeding given the probable size of such a facility and the transmission of electricity from the facility to the utility's grid.

The Companies do not intend to offer customer-sited generators simply for the purpose of generating electricity for the customer, since the Companies have not found that such applications would be cost-effective for the utilities at this time, and do not intend to engage in the business of providing off-grid, customer-sited generators for power purposes.

Utility-Owned CHP Systems

The reasons for, and the benefits of, utility participation in the provision of CHP systems are detailed in the Companies' CHP Application. The provision of CHP services by utilities is a natural step in the evolution of electric utility services, and electric utility customers should have the option of acquiring CHP systems from Hawaii utilities.

Utilities can offer DG/CHP to utility customers as a regulated utility service in two ways, each of which requires Commission approval: (1) They can contract with specific customers under special service contracts (termed Rule 4 CHP contracts), and obtain specific Commission approval for each such contract, and/or (2) they can offer such a service under a CHP tariff schedule approved by the Commission.

The Companies filed their Application on October 10, 2003 in Docket No. 03-0366 requesting approval of each Company's proposed CHP Program and related tariff provision (Schedule CHP, Custom-Sited Utility-Owned Cogeneration Service). Under the CHP Program and Schedule CHP, the Companies propose to offer CHP systems to eligible utility customers on the islands of Oahu, Maui and Hawaii as a regulated utility service. The Application requests that the Commission (1) approve each Company's CHP (Combined Heat and Power) Program and initial 5-year budget of capital expenditures for the program, subject to the flexibility provisions included in the application, and (2) approve each Company's proposed Schedule CHP, Customer-Sited Utility-Owned Cogeneration Service ("Schedule CHP"), and the proposed standard form CHP Agreement and Eligibility Criteria.

The Application also indicated that the Companies would request approval on a contract-by-contract basis under each Company's Tariff Rule No. 4 for CHP system projects that fall outside the scope of the proposed program. As stated in the Companies' response to the informal complaint, the Companies have made a limited number of proposals to customers to install and operate utility-owned CHP systems at the customers' sites, and have executed a number of letters of intent and memoranda of understanding to conduct preliminary engineering for potential CHP projects. Any contracts resulting from the proposals would be subject to PUC approval under a Company's Tariff Rule No. 4, or would be filed under a Company's Schedule CHP (if the tariff is in effect and the project is within the scope of the tariff).

There are a number of benefits to active utility participation in the CHP market through a CHP tariff program:

- The utilities' participation on a regulated basis will ensure that the interests of all customers are taken into consideration. Benefits should be available to the customers for whom DG/CHP is a viable option, but the interests of other non-participants should be protected. The independent implementation of DG/CHP results in a loss of revenue to the utility and all customers are then ultimately adversely impacted by the lack of contribution to fixed costs from the customers that implement third party DG/CHP.
- Utility participation in the CHP market provides the utility customers with one more option to meet their energy needs – in the words of one customer, it means "one stop shopping".
    - The efficiencies of CHP systems provide for lower costs to meet customers' needs.

- Customers want to focus on what they do best and let the utility do what it does best:
    - Own, operate and maintain power facilities
    - Manage fuel procurement for power facilities
    - Manage the electrical system interface
- Utility participation in the DG/CHP market can help to create a bigger DG/CHP market:
  - It validates the benefits of CHP for those customers that are in a "waiting-and-see" mode.
  - Customers may have greater confidence in the technology if the utility is involved

There is broad-based customer support for a utility CHP program. Many customers do not want to own, operate or maintain CHP units. Some customers may be uncertain about the staying power of mainland-based vendors, but trust the utility to be there for a long-term and to work out any problems that may occur. Most customers at least want the utility to be an option they can consider. Many customers want to focus on their core business and let the utility be the energy company. Hotel operators, for instance, generally do not want to own, operate and maintain power systems. They want to reduce operating costs any way they can, and they want to do it with a minimal amount of investment and risk on their part.

A key factor in the favorable response of most customers has been the fact that CHP is simply one of the options the utility considers in helping the customer seek optional energy efficiency. Customers seem to appreciate the fact that the utility is not in the equipment sales business and will, consequently, also evaluate other options such as the installation of energy conservation measures, tailored to the unique needs of that customer and facility.

Customers are asking the utility to offer a full range of services related to their energy needs. Since there are many options available, the utility approach is to assist the individual customer in determining which options are best for that customer's site. In some cases, the best way to heat water may be with heat pumps – in others, a combined heat and power system may be best. For some sites, high efficiency electric chillers make more sense than absorption chillers using waste heat from a combined heat power system. Since the utility is not in the equipment sales business, customers indicate that they are more confident that the utility will do a more objective job of analyzing the options and helping the customer to find the optimal energy solution for their site.

Issue 3. What is the role of the regulated electric utility companies and the Commission in the deployment of distributed generation in Hawaii?

HECO/HELCO/MECO Preliminary Position:

The roles of the utility and of the Commission with respect to DG depend on the DG application. In response to Issue No. 1, the Companies identified seven categories of DG applications. The role of the utility with respect to each DG application is as follows:

(1) Customer-sited emergency generation: A few utilities have provided such service under tariff, with or without the right to use the emergency generators for peaking purposes when there is a capacity shortage, but the Companies do not currently anticipate providing such a service;

(2) Substation-sited peaking generation: The Companies intend to use DG for this purpose under appropriate circumstances;

(3) Substation-sited generation to address case-specific T&D problems: The Companies intend to use DG for this purpose in appropriate circumstances;

(4) Customer-sited CHP systems: The Companies intend to offer CHP systems under circumstances where it is cost-effective for the utilities to do so, and offering such a service does not unduly burden non-participating customers;

(5) Customer-sited cogeneration: The Companies do not intend to offer such a service, but would consider owning such facilities on a case by case basis (for example, when such ownership would facilitate installation of a biomass plant that would contribute to meeting RPS goals);

(6) Off-grid, customer-sited generation: The Companies do not intend to offer such a service; and

(7) Customer-sited generation for power purposes only: The Companies do not intend to offer such a service.

With respect to utility proposals for substation-sited peaking generation and substation-sited generation to address case-specific T&D problems, the Commission's role is to review such proposals under paragraph 2.3.g.2 of General Order No. 7.

With respect to utility offerings of CHP systems, the Commission's role is to review the application for a CHP program as it would other supply-side planning tools under the criteria included in the IRP Framework, and to approve the Eligibility Criteria (see, e.g., CHP Application, pages 31-33 and Attachment I), and the program budget and budget flexibility provisions (see, e.g., CHP Application, pages 11-13) in order to review whether the program will address its intended purposes. In the Companies' view, it is appropriate for contracts filed under an approved CHP program to be reviewed under a file and suspend process, for the reasons explained in the CHP Application (pages 34-36).

The utility also plans to request approval for the installation of CHP systems that may fall outside the scope of the CHP program. The Commission's role would be to review applications for approval of the Rule 4 contracts under paragraph 2.3.g.2 of General Order No. 7 and to determine the consistency of these individual projects with the overall objectives of the CHP program (e.g., to review the consistency of the form of contract and the pricing structure with that included in the CHP program).

In the case of customer-sited emergency generation, the role of the utility is to enforce tariff provisions which require that such generation not be operated in parallel with the utility grid.

With respect to customer-sited CHP systems or other DG, the utility's role is to develop and enforce interconnection standards, which the Companies have done by filing a Tariff Rule 14.H. The utility also provides back-up and supplemental service to the customers. The Commission's role is to review and approve the tariff, which it has done in approving Tariff Rule No. 14.H.

In addition, the utility's role is to design and obtain approval for utility tariff provisions that ensure that utility customers will not be unduly burdened by the provision of utility back-up service to customers with customer-sited CHP systems or DG, and the Commission's role is to review and approve such tariff provisions. (See response to Issue No. 10.)

Finally, in the case of customer-sited CHP systems and DG owned by third-parties, the Commission's role is to review whether the retail sale of electricity by such third-party owners falls within the purview of the public utility statutes. To date, the Companies have not taken the position that these third-party owned installations should be regulated by the Commission, due to the relatively small number of such installations.

Impact Issues

Issue 4. What impacts, if any, will distributed generation have on Hawaii's electric transmission and distribution systems and market?

HECO/HELCO/MECO Preliminary Position:

The impact of distributed generation on Hawaii's transmission and distribution ("T&D") systems is very complex and requires detailed studies on a case-by-case basis. Tariff Rule 14.H establishes how the interconnection of such systems is to be handled. However, there is a practical limit to amount of DG on distribution circuits, which varies depending on the specific circumstances of each circuit. (See also response to Issue No. 5.)

The initial installations of small-scale DG units at customers' sites (for other than emergency backup) were often problematic for both the customers and the utility. From the customers' standpoint, there were performance problems with the units, with the fuel for the units, and with the maintenance of the units. A number of the initial units are no longer operable and/or have been replaced.

In concept, DG can impact or defer the need for certain T&D facilities. T&D facilities (such as lines and transformers) may have to be upgraded in capacity or additional lines may have to be added to avoid overloads under contingency and projected peak conditions. If enough DG is added and reliably operated so that the peak load growth is reduced, then the deferral benefit might be realized. There are practical considerations, however, that limit the ability of DG to be used on a targeted basis to defer specific T&D projects.

Depending upon who installs, owns and operates DG systems, the impacts on the Hawaii electric market are markedly different. If a third-party or a customer installs DG, the load to be served by the utility is reduced and the utility loses the portion of the rate normally charged to the customer to cover fixed costs. When that happens, those costs must be borne by other ratepayers when rates are adjusted at the next rate case. In the interim, the utility shareholders bear the loss. If the utility owns and operates the DG system, the loss of fixed costs is substantially reduced and the overall program costs and payments can be structured so that all parties (the utility, the customer, other ratepayers) are better off by having the project completed.

Issue 5. What are the impacts of distributed generation on power quality and reliability?

HECO/HELCO/MECO Preliminary Position:

If distributed generation is interconnected to the grid strictly in accordance with the requirements of Rule 14 H, there should be no substantive adverse impact on power quality. The Companies filed proposed interconnection tariffs, including interconnection standards and a standard form of interconnection agreement, in January 2002, and submitted modifications agreed to by the CA in September 2002. The Commission conditionally approved the tariffs by Decision and Order No. 19773 ("D&O 19773"), issued November 15, 2002 in Docket No. 02-0051 (Consolidated). The Companies and the CA noted the Commission's observations in D&O No. 19773, and jointly submitted revisions in February 2003. The Companies' revised Tariff Rule Nos. 14.H were approved on March 6, 2003 by Decision and Order No. 20056. In D&O 19773, the purpose of and the key section of these standards were summarized:

> "Appendix I sets forth comprehensive interconnection standards and technical requirements that are intended to facilitate the interconnection and parallel operation of a customer's distributed generating facility with the utility's electrical system. The underlying purposes of the technical interconnection requirements are to: (1) maintain safety, reliability, and power quality and restoration; (2) protect the utility's and customer's equipment and facilities; and (3) advance the operating efficiencies of the utility's electrical system.
>
> In general, the interconnection standards and technical requirements consist of: (1) a definitions section; (2) general interconnection guidelines; (3) design requirements; (4) operating requirements; (5) technology specific requirements; and (7) schematic diagrams illustrating "typical equipment and protective device requirements for large synchronous, induction, and inverter generators".

Continuing the current practices established by these interconnection standards is critical to maintaining the purposes defined in the Commission's order.

The impact of distributed generation located at customer facilities is dependant upon location specific issues such as the following:

- configuration of the distribution system, radial vs. network
- length of distribution lines
- penetration of distributed generation on the primary circuit and the back up circuit
- reliability and redundancy of customer systems
- synchronous or induction generation
- grounding of transformers and other equipment
- short circuit characteristics of the distribution circuit

Given these various factors, the power quality and reliabilities impact of a specific distributed generator is dependant upon an individual site.

However, DG technologies can have some adverse impacts on system reliability:

- Unless a sufficient number of DG units are in existence on a circuit to create diversity, all of the DG units must be backed up by the grid. This is a critical issue when considering whether or not to give credit to DG capacity as system capacity.
- If the utility does not control the operations of and maintenance quality of a DG installation, it may encounter unexpected outages that adversely impact local voltage and frequency control. If the utility owns and operates the DG, it has a greater ability to anticipate problems and deal with them proactively.

There are some circumstances where DG can have a positive impact on power quality and reliability.

- Locating DG at targeted utility substations can increase reliability.
- Synchronous generators that are dispatchable by the utility may provide voltage support.
- For Transmission and Distribution systems with a radial configuration, localized generation can enhance reliability, such as the installation of generation at the Hana substation on Maui and other installations that have occurred on the HELCO system. These systems being dispatchable by the utility can improve reliability.
- In the event of a utility interruption, a DG system installed at a customer facility may increase reliability for that customer. For this to happen, the DG system must be able to operate with utility power (e.g., synchronous generator). Also, the interconnection equipment at the customer facility must allow the customer's electrical system to operate isolated from the utility. In structuring HECO's CHP program, the cost of equipment to operate isolated from the utility system is borne by the customer. This approach ensures that the cost of increasing reliability for an individual customer facility is paid by that customer and not all ratepayers.

Issue 6. What utility costs can be avoided by distributed generation?

HECO/HELCO/MECO Preliminary Position:

In concept, installation of distributed generation can defer the need for new transmission and distribution ("T&D") capacity by providing customers with a nearby redundant source of electricity that otherwise would have been provided by T&D upgrades.

In practice, the ability of distributed generation to defer T&D upgrades depends on the specific nature of an area's T&D system and the ability to site DG there. As a case in point, MECO installed two diesel generators in Hana, which is served by a single radial transmission line. Prior to the installation of the distributed generators, the area was at risk of power interruptions whenever there was a problem or maintenance needed to be done on the line. The distributed generators provided an attractive alternative to installation of additional transmission infrastructure.

Distributed generation capacity, if sufficiently large, can also help defer new central plant generation. First, customer-sited DG owned by third-parties and customers has the potential to defer central station generation and associated bulk transmission (if any). The actual ability of such customer-sited DG to achieve the deferral benefit depends on the number and diversity of such installations, their reliability, their ability to coordinate maintenance with the utility, and their sustainability. These installations would also avoid utility central station generation fuel and variable O&M costs to the extent they displace utility generated energy. However, these benefits would be offset (and generally more than offset) by the utility's revenue loss (and the loss of the customer's contribution to fixed costs). This phenomenon is referred to as an uneconomic bypass. (See response to Issue No. 10.)

In the case of utility-owned customer-sited CHP systems, the utility's program to install such systems can be structured so as to defer central station generation and any associated bulk transmission, as well as to avoid central station fuel and variable O&M costs. (That is the intent of the Companies' proposed CHP program and planned Rule 4 applications.) At the same time, the utility would incur O&M/fuel costs associated with the CHP systems. The utility also would retain revenues (less any discount offered in the electricity price, and less revenues for electricity displaced by the use of the CHP systems' waste heat), to the extent that utility-owned CHP systems displace DG that would have been installed by the customers or third-parties had the utility not installed its CHP systems. In the case of utility-owned CHP systems, all of these factors can be taken into account so that non-participating customers are not burdened by the offering of such services.

Issue 7. What are the externalities costs and benefits of distributed generation?

HECO/HELCO/MECO Preliminary Position:

Distributed generation brings both positive and negative externality impacts, as described below. In general, many of the negative externalities can be mitigated by proper design and siting. The positive externalities of distributed generation include the following:

- Ability to meet specific needs of an energy user. Distributed generation, in particular that which is installed at an end-user's site, can be tailored to meet specialized energy needs. For example, distributed generation can provide backup or premium power to meet reliability or power quality needs of a facility. In another instance, a facility with sufficient thermal loads may be able to utilize a combined heat and power system to achieve greater energy efficiency and energy savings. The flexibility and variety of distributed generation systems and applications is a key benefit.
- Fuel efficiency/avoidance of fossil fuels. Distributed generation from renewable energy directly avoids the burning of fossil fuels. Additionally, certain types of distributed generation that use fossil fuels can be highly efficient, such as combined heat and power. The thermal efficiency of fuel usage in a combined heat and power system typically ranges from 85% to 90%, versus 35% to 40% for a conventional central station generating unit. Distributed generation of all types can reduce transmission line losses, providing additional efficiency improvements.

- Scale. The smaller scale of distributed generation provides an enhanced ability to switch to new technologies due to lower incremental costs (i.e. avoidance of a single large investment). In addition, customer load demands can be more closely met with new distributed generation than with large increments of central station power. In some cases, however, the small scale of distributed generation may not be sufficient to keep up with overall system load growth.

Negative externalities of distributed generation are chiefly in the area of environmental externalities, as described below.

- Air emissions. Distributed generation that is based on fossil fuels – reciprocating engines, combustion turbines, and microturbines – brings with it associated emissions, including NOx, SO2, CO, and CO2. One concern that has been raised is that to the extent DG is located closer to the locations of load demand than central station power generation, there will be greater likelihood of a populace being exposed to DG emissions. However, this is mitigated by the fact that DG installations and their emissions are much smaller in scale compared to central station power plants. Additionally, emissions impacts from DG can be mitigated with appropriate emissions controls, good engineering practice design of exhaust ducts, and/or operational measures to assure efficient combustion of fuel. The Hawaii State Department of Health regulates emissions via its noncovered source and covered source air permitting rules.

- Noise. Distributed generation that employs moving machinery – reciprocating engines, combustion turbines, microturbines, and wind turbines – emits noise. Given that DG may be sited at the distribution level of a power grid in residential and commercial areas, there will naturally be more sensitivity to noise impacts than for a central station power plant located in an industrial area. In Hawaii, there are fairly strict noise standards for residential areas. The Hawaii Department of Health regulates and enforces these standards.
- Visual impact. Distributed generation may bring both positive and negative visual impacts. Visual impacts can be positive from the perspective that if transmission infrastructure can be deferred or obviated, the visual impacts of that infrastructure can be avoided. Impacts can be negative if the distributed generation installation itself is visually obtrusive, such as may be the case with wind turbines, photovoltaic arrays, or exhaust stacks.

Issue 8. What is the potential for distributed generation to reduce the use of fossil fuels?

HECO/HELCO/MECO Preliminary Position:

HECO projects that distributed generation will complement, but not replace, central station generation in Hawaii in addressing load growth. The amount of forecasted load growth is much higher than can be met with distributed generation alone, given the relatively small scale of distributed generation systems.

Notwithstanding this, as discussed in Issue No. 7 above, distributed generation from renewable sources of energy directly avoids the burning of fossil fuels. Wind turbines and photovoltaic systems are the most likely form of renewable distributed generation. Additionally, certain types of distributed generation that use fossil fuels can be highly efficient, such as combined heat and power. The thermal efficiency of fuel usage in a combined heat and power system typically ranges from 85% to 90%, versus 35% to 40% for a conventional central station generating unit. Thus, roughly half as much fuel would be required by the combined heat and power system. Distributed generation of all types can also reduce transmission line losses, providing additional efficiency improvements and reduction in the use of fossil fuels.

The amount of fossil fuel reduction that might be achievable in Hawaii through the use of distributed generation depends upon the type of distributed generation technology, site-specific factors, and the baseline state of central station generation to which DG is being compared. The type of DG technology employed will depend on its technical and economic feasibility, and ability to be integrated into the grid or a customer's system.

For example, the Companies' position is that CHP systems are technically and economically feasible. In Appendix B of its application for a CHP program in Docket No. 03-0366, the Companies projected installation of approximately 77 MW of CHP capacity over a twenty year planning horizon. The amount of fossil fuel avoided by this distributed generation will depend on the usage of the individual units and their individual efficiencies. The fuel efficiency of the CHP systems will be compared to that of the central station power plants in existence at that time, which would otherwise have supplied the energy. For other types of distributed generation systems such as microturbines, fuel cells, wind turbines or photovoltaics, technical and economic feasibility in large part remain to be determined.

Implementation Issues

Issue 9. What must be considered to allow a distributed generating facility to interconnect with the electric utility's grid?

HECO/HELCO/MECO Preliminary Position:

For a distributed generating facility to interconnect with the Companies' grids, it must comply with their respective Rule 14.H, Interconnection of Distributed Generating Facilities Operating in Parallel with the Company's Electric System.

All distributed generating facilities, including any proposed Company-owned and –operated CHP systems, must comply with Rule 14.H, and will be subject to the same technical review and study process.

Background on Rule 14.H

On January 15, 2002, the Companies filed their proposed modification to their respective Rule 14, adding Paragraph H., to establish interconnection standards and to require an interconnection agreement for distributed generating facilities operating in parallel with their respective electric system, Transmittal No. 02-01, 02-02H and 02-01M, respectively. By Order No. 19231, filed March 4, 2002, the Commission consolidated the three transmittals, and opened Docket No. 02-0051. On March 21, 2002 and April 10, 2002, the Companies filed responses to the Consumer Advocate's first and second submission of information requests, respectively. By a joint letter filed September 23, 2002, the Companies and the Consumer Advocate jointly submitted for Commission review and approval their agreed upon proposed modification to Rule 14 to establish interconnection standards and to require an interconnection agreement for distributed generating facilities operating in parallel with the Companies' respective electric system. In Decision and Order No. 19773, filed November 15, 2002, Docket No.

02-0051, the Commission conditionally approved the Companies' proposed modification to their respective Rule 14, and the Commission made several observations with respect to the proposed modification to Rule 14. By a joint letter filed February 19, 2003, the Companies and the Consumer Advocate jointly submitted for Commission review and approval their agreed upon revisions to the proposed modification to Rule 14 that resulted from their review and consideration of the Commission's observations that were included in Decision and Order No. 19773, and certain other revisions proposed by the Companies. On March 6, 2003, the Commission issued Decision and Order No. 20056, Docket No. 02-0051, which provided final approval of the Companies' proposed modification to Rule 14. On March 14, 2003, the Companies filed their respective Rule 14.H tariff sheets, to be effective March 21, 2003. Also included in the Rule 14.H tariff sheets are 1) Appendix I, Distributed Generating Facility Interconnection Standards Technical Requirements, 2) Appendix II, Standard Interconnection Agreement, and 3) Appendix III, Interconnection Process Overview. By Order No. 20220, filed May 30, 2003, the Commission approved the Companies' proposed modification to the Standard Interconnection Agreement, Appendix II, for self-insurance for governmental entities. On June 4, 2003, the Companies filed their respective revised Rule 14.H tariff sheets for the Standard Interconnection Agreement, Appendix II, to be effective June 6, 2003.

Issue 10. What is the appropriate rate design and cost allocation issues that must be considered with the deployment of distributed generating facilities?

HECO/HELCO/MECO Preliminary Position:

The Companies' existing rate schedules have certain provisions to account for differences in the cost to serve high load factor and low load factor customers (e.g., load factor blocks, and demand ratchets). These provisions are important given that the Companies' existing demand charges for Schedule J and Schedule P customers are still set well below the level of their demand costs. (As a result, the Companies' energy rates recover a large portion of their demand and customer costs, because demand charges are substantially lower than demand costs, and customer charges are substantially lower than customer costs.) Because of this, lost energy sales as a result of customer-sited CHP systems or DG result in non-recovery of a significant amount of demand and customer costs. As was addressed in Docket No. 99-0207 (see, e.g., HELCO's Final Standby Service Rider Proposal and Supporting Statement, filed January 24, 2001), standby customers who impose a significant standby load on the system, but purchase little or no energy from the utility, could avoid paying their share of the demand costs that are embedded in the energy rates. HELCO's position on whether its existing standby rate rider should be retained is set forth in the CHP Application (pages 73-74). The need for separate standby rates would have to be determined on a utility-by-utility basis.

The fact that substantial amounts of demand costs are recovered through the energy rates, and the fact that the commercial and large power rate classes generally subsidize the residential class to some extent, also have created the potential for uneconomic bypass. HECO and HELCO have obtained approval for certain customer retention rate provisions in Rule 4 of their respective tariffs in order to address the issue of uneconomic bypass. <u>See</u> CHP Application, Exhibit C (page 5).

<u>Uneconomic Bypass</u>

"Uneconomic bypass" occurs when the cost of a customer's alternative source of electrical energy is lower than the cost of receiving service under the Company's applicable standard rate schedule, but higher than the Company's <u>marginal</u> cost of providing service.

Due to the manner in which rates have been established in Hawaii, the Company's rates for its large commercial customers are not only higher than the Company's marginal costs, but also are higher than its average embedded costs of providing service to such customers.

In Hawaii, fully allocated embedded cost-of-service studies are the starting point for the allocation of revenue requirements among rate classes. However, the rates for some classes (e.g., the residential class) have been set at a level that produces a lower-than-system average rate of return, while the rates for the remaining classes (e.g., the large power and commercial classes) produce a higher-than-system average rate of return as a result. This benefits the residential class, but only as long as large commercial customers do not leave the system because of rates that are higher due to the subsidy.

The loss of a significant amount of load from the Company's system due to uneconomic bypass would have an immediate and significant impact on the magnitude of the Company's revenues and a corresponding adverse impact on the remaining customers' rates. Rates would have to be set higher in future rate cases in order to allow for recovery of fixed costs that were previously recovered through energy sales to customers that subsequently add on-site generation facilities.

Utility Service Termination Charges

While the Companies currently do not intend to propose service termination charges where customers terminate or substantially reduce the level of the electricity supplied by the electric utility (and substitute other options) to address these types of issues, the appropriateness of having service termination charges was raised in the Competition Docket, Docket No. 96-0493.

CHP Pricing

The appropriate type of pricing structure and pricing flexibility required for the CHP tariff are addressed in the CHP Application (pages 22-31).

Issue 11. What revisions should be made to the integrated resource planning process?

HECO/HELCO/MECO Preliminary Position:

No changes to the IRP Framework are required for the consideration of DG. In the current round of integrated resource planning for HECO, a significant effort is being made to consider DG and CHP technologies and their potential contribution to meeting the electrical needs of customers. By its nature, DG is difficult to analyze in this process. The IRP process analyzes resources at the system level prior to the identification of specific projects. That means that DG must be considered on a generic basis without consideration of the specific impacts a particular project may have on the system that are site specific. An individual DG project is also generally too small to impact the timing of central station units or transmission line timing. In order to complete a fair evaluation, an aggregate forecast of DG resources must be considered as was done for CHP system in the analysis done for the CHP Program application in Docket No. 03-0366.

Issue 12. What forms of distributed generation (e.g. renewable energy facilities, hybrid renewable energy systems, generation, cogeneration) are feasible and viable for Hawaii?

HECO/HELCO/MECO Preliminary Position:

See Preliminary Position with respect to Issue No. 1.

Issue 13. What revisions should be made to state administrative rules and utility rules and practices to facilitate the successful deployment of distributed generation?

HECO/HELCO/MECO Preliminary Position:

In order to facilitate the successful deployment of DG, the Commission should approve the Companies' proposed CHP program and CHP tariff, and expeditiously review and approve applications for individual CHP projects under Rule 4 of the Companies' tariffs.

The Companies' proposed CHP program falls within the definition of the "successful deployment of distributed generation", because the CHP installations would be cost-effective in the IRP sense (based on the quantifiable and qualitative costs and benefits addressed in the CHP Application) and would facilitate customer choice. The "successful deployment of distributed generation" also should avoid undue impacts on utility systems, and on non-participating utility customers. Steps have already been taken to address the impacts on utility systems through the development and approval of Tariff Rule 14.H. The Companies' participation in offering CHP systems through their proposed CHP programs and Rule 4 contracts would help avoid undue impacts on non-participating customers.

The benefits of a utility CHP program are addressed in the CHP Application (pages 14-15), along with the unquantified benefits of CHP systems (pages 16-19). The appropriate methodology used to assess the quantifiable costs and benefits of the CHP program, in the IRP sense, also are addressed in the CHP Application (pages 16, 51-53, 58-61).

It is the position of the Companies that no matter how one defines success, the participation of the utilities in the DG market will increase the odds of success. On that basis, the following changes in rules and practices are suggested:

- In order for the utilities to respond to the needs of customers in a timely manner, the review and approval processes need to be streamlined.
    - Standard form contracts should be adopted
    - Tariff structures for DG should be implemented
    - The process of demonstrating ratepayer benefits should be standardized
- Fuel cost recovery methodologies should be revised to accommodate DG.

Issue 14. The Parties and Participants may also address general issues regarding distributed generation raised in the informal complaint filed by Pacific Machinery, Inc., Johnson Controls, Inc. and Noresco, Inc. against HECO, MECO, and HELCO on July 2, 2003 (Informal Complaint No. IC-03-098), but not specific claims made against any of the Parties named in the complaint.

HECO/HELCO/MECO Preliminary Position:

The Companies' position on general issues raised in the informal complaint are provided in the Companies' positions to Issues Nos. 1 through 13. The appendix to the informal complaint listed "questions and concerns" in 21 categories, with 56 bullet points (cast as questions, multiple questions, rhetorical questions and statements). Those specific to the Companies have been deemed by the Commission to be beyond the scope of this proceeding. However, the Companies responded to those points to which the Commission directed a response in their response to the Commission dated August 5, 2003.

Two matters that warrant further response are the agreement the Companies entered into with Hess Microgen and the exclusive provider clause in the form CHP contracts proposed by the Companies in their CHP Application.

Preferred Supplier Arrangements

As stated in response to Issue No. 1, in order for a form of DG to be "feasible and viable for Hawaii", it must be (1) technically feasible, (2) commercially available, (3) economically viable (i.e., cost-effective versus other options), (4) price competitive in the short-term, (5) sustainable in the long-term (i.e., backed up by adequate infrastructure support with respect to O&M and fuel), (6) able to address site-specific constraints (e.g., with respect to permitting) and (7) able to meet the perceived needs of customers.

Preferred supplier arrangements for CHP systems can help to make the systems cost-effective, price competitive and sustainable.

Supplier agreements allow for the better management of project costs. The specific requirements in most projects can be met by a variety of equipment. There is generally not sufficient technical differentiation between the performances of internal combustion engines of the same size to clearly favor one vendor over another. Through the use of standardized units, training programs for the operation and maintenance of the units can be standardized. The timing and scheduling for the installation of the systems can be more efficient as the units would be standardized. Non-standardized installations may require contracting operations and maintenance services.

The differentiator in favor of Hess was the packaging concept developed by Hess, which dramatically reduces field construction costs. Hess utilizes an array of standard components and prepares a design by selecting the appropriate standard components from that array. The use of common equipment also provides for more uniform and consistent designs and thereby significantly reduces maintenance requirements and costs.

Hess offers skid mounted, pre-wired, pre-piped, and factory tested combined heat and power systems. This concept reduces on-site construction time and disruption as well as start-up problems. Hess performs thorough factory tests and evaluation of individual components and the total system for reliability and value.

The entire Hess system (not just components) is UL[1] approved. Although focused on safety, the UL approval provides a level of quality assurance to both the utility and the customer.

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1 Underwriters Laboratories, Inc. (UL) is an independent, not-for-profit product safety testing and certification organization and have tested products for public safety for more than a century.

In addition, the Company took into consideration the proven capabilities of Hess with regard to the specific tasks that are part of the development and operation of a CHP project in Hawaii, which allows the Company to tap into that expertise when needed.

It appears that the nature of the Hess-HECO agreement is still largely misunderstood. The agreement does not prohibit Hess from selling equipment directly to a customer if that is what the customer wants; nor does it limit the equipment that the Companies can utilize to meet the requirements of a specific project. Basically, it simply requires the Companies to use the Hess equipment in circumstances wherein the Hess equipment can clearly meet the needs of the project and the size of the engine is smaller than 1 MW. The Companies have already encountered circumstances where the standard Hess Microgen offering does not meet the needs of the customer and they have worked with Hess to substitute another vendor's reciprocating engine generator set for the standard offered by Hess. A number of projects have also been identified that require generating units larger than any offered by Hess Microgen. The key point to remember is that the HECO-Hess agreement is in place to take advantage of the Hess experience and utilize both packaging and standardization that yield significant efficiencies and cost savings.

As described above, the Hess-HECO arrangement will not suit or apply to all CHP projects. It is entirely possible that preferred supplier agreements with other equipment suppliers may be developed to the extent that they provide benefit to HECO and its customers.

Exclusive Provider of Electricity Clause

One issue raised in the complaint that the Companies have reconsidered is the use of the "sole supplier" clause in their standard Cogeneration Energy Purchase Agreement. This clause will be deleted from contracts.

CERTIFICATE OF SERVICE

I hereby certify that I have this date served a copy of the foregoing **PRELIMINARY STATEMENT OF POSITION AND EXHIBIT A**, together with this Certificate of Service, by hand delivery and/or by mailing a copy by United States mail, postage prepaid, to the following:

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